--34. The composite structure of claim 33 wherein said first interconnect metal is selected from the group consisting of copper and aluminum.--

--35. The composite structure of claim 33 wherein said first via metal is selected from the group consisting of copper and tungsten.--

--36. The composite structure of claim 33 further comprising a second metal pad structure below said first via pad structure, said second metal pad structure comprising a second interconnect metal, said second interconnect metal contacting said first via metal.--

--37. The composite structure of claim 36 wherein said second interconnect metal is selected from the group consisting of copper and aluminum.--

--38. The composite structure of claim 33 further comprising a second metal pad structure below said first via pad structure, said second metal pad structure comprising a plurality of segments of a second interconnect metal and a second plurality of dielectric fillers, at least one of said plurality of segments of said second interconnect metal contacting said first via metal.--

--39. The composite structure of claim 38 wherein said second interconnect metal is selected from the group consisting of copper and aluminum.--

--40. The composite structure of claim 33 wherein said first plurality of dielectric fillers comprise a low-k dielectric.--

--41. The composite structure of claim 40 wherein said low-k dielectric is selected from the group consisting of porous silica, fluorinated amorphous carbon, fluoro-polymer, parylene, polyarylene ether, silsesquioxane, fluorinated silicon dioxide, and diamondlike carbon.--

--42. The composite structure of claim 38 wherein said second plurality of dielectric fillers comprise a low-k dielectric.--

--43. The composite structure of claim 42 wherein said low-k dielectric is selected from the group consisting of porous silica, fluorinated amorphous carbon, fluoro-polymer, parylene, polyarylene ether, silsesquioxane, fluorinated silicon dioxide, and diamondlike carbon.--

--44. The composite structure of claim 33 wherein said first metal pad structure is a bonding pad.--

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--45. A method for fabricating a composite structure, said method comprising steps of:

fabricating a first via pad structure, said first via pad structure comprising a plurality of segments of a first via metal and a first plurality of dielectric fillers;

fabricating a first metal pad structure above said first via pad structure, said first metal pad structure comprising a first interconnect metal, said first interconnect metal contacting at least one of said plurality of segments of said first via metal.--

--46. The method of claim 45 wherein said first metal pad structure is a bonding pad.--

--47. The method of claim 45 wherein said first interconnect metal is selected from the group consisting of copper and aluminum.--

--48. The method of claim 45 wherein said first via metal is selected from the group consisting of copper and tungsten.--

--49. The method of claim 45 wherein said first plurality of dielectric fillers comprise a low-k dielectric.--

--50. The method of claim 49 wherein said low-k dielectric is selected from the group consisting of porous silica, fluorinated amorphous carbon, fluoro-polymer, parylene, polyarylene ether, silsesquioxane, fluorinated silicon dioxide, and diamondlike carbon.--

--51. A composite structure comprising:

a first via pad structure comprising a first via metal;

a first metal pad structure below said first via pad structure, said first metal pad structure comprising a plurality of segments of a first interconnect metal and a first plurality of dielectric fillers, at least one of said plurality of segments of said first interconnect metal contacting said first via metal.--

--52. The composite structure of claim 51 wherein said first via metal is selected from the group consisting of copper and tungsten.--

--53. The composite structure of claim 51 wherein said first interconnect metal is selected from the group consisting of copper and aluminum.--

--54. The composite structure of claim 51 further comprising a second via pad structure below said first metal pad structure, said second via pad structure comprising a second via metal, said second via metal contacting said first interconnect metal.--

--55. The composite structure of claim 54 wherein said second via metal is selected from the group consisting of copper and tungsten.--

--56. The composite structure of claim 51 further comprising a second via pad structure below said first metal pad structure, said second via pad structure comprising a plurality of segments of a second via metal and a second plurality of dielectric fillers, at least one of said plurality of segments of said second via metal contacting said first interconnect metal.--

--57. The composite structure of claim 56 wherein said second via metal is selected from the group consisting of copper and tungsten.--

--58. The composite structure of claim 51 wherein said first plurality of dielectric fillers comprise a low-k dielectric.--

--59. The composite structure of claim 58 wherein said low-k dielectric is selected from the group consisting of porous silica, fluorinated amorphous carbon, fluoro-polymer, parylene, polyarylene ether, silsesquioxane, fluorinated silicon dioxide, and diamondlike carbon.--

--60. The composite structure of claim 56 wherein said second plurality of dielectric fillers comprise a low-k dielectric.--

--61. The composite structure of claim 60 wherein said low-k dielectric is selected from the group consisting of porous silica, fluorinated amorphous carbon, fluoro-polymer, parylene, polyarylene ether, silsesquioxane, fluorinated silicon dioxide, and diamondlike carbon.--

--62. A composite structure comprising a plurality of segments of a first interconnect metal and a first plurality of dielectric fillers, said plurality of segments of said first interconnect metal being electrically connected to each other.--

--63. The composite structure of claim 62 wherein said composite structure is a bonding pad.--

--64. The composite structure of claim 62 wherein said first interconnect metal is selected from the group consisting of copper and aluminum.--

--65. The composite structure of claim 62 further comprising a first via pad structure below said first metal pad structure, said first via pad structure comprising a first via metal, said first via metal contacting said first interconnect metal.--

--66. The composite structure of claim 65 wherein said first via metal is selected from the group consisting of copper and tungsten.--

--67. The composite structure of claim 62 wherein said first plurality of dielectric fillers comprise a low-k dielectric.--

--68. The composite structure of claim 67 wherein said low-k dielectric is selected from the group consisting of porous silica, fluorinated amorphous carbon, fluoro-polymer, parylene, polyarylene ether, silsesquioxane, fluorinated silicon dioxide, and diamondlike carbon.--